NOVEMBER/DECEMBER 2024

GPH31/DPH31 — CONDENSED MATTER PHYSICS

Shanmuga Industries Arts & Science College
T.V.Malai

Time : Three hours Maximum : 75 marks

SECTION A — (10 × 2 = 20 marks)

Answer ALL questions.

1. Write a note on Bragg's law.
2. What is unit cell?
3. Write the expression for calculating phase velocity.
4. What is meant by Phonons?
5. Write a note on Bloch theorem.
6. State Wiedmann-Franz law.
7. State Hund's rule.
8. Write a note on Magnons.
9. What is Meissner effect?
10. Define – Type 1 Super conductor.

SECTION B — (5 × 5 = 25 marks)

Answer ALL questions.

11. (a) Write an expression on Atomic packing factor of FCC crystal.

Or

(b) Explain in detail about Brillouin Zone.

12. (a) Write a short note on Einstein's model of Specific heat.

Or

(b) Write briefly about Inelastic scattering by phonons.

13. (a) What is Hall effect? Derive an expression for Hall coefficient. Mention the uses of Hall effect.

Or

(b) Write a note on "Band theory of metals and semiconductor".

14. (a) Differentiate between diamagnetism and paramagnetism.

Or

(b) What is Adiabatic demagnetization? Tell about its applications?

15. (a) Describe Type I and Type II superconductors.

Or

(b) Explain the concept of BCS theory.

SECTION C — (3 × 10 = 30 marks)

Answer any THREE questions.

16. How many crystal systems are there? Explain them.

17. Explain the concept of Debye's model of specific heat.

18. Explain briefly about Kronig-Penny model.

19. Write a brief note on Quantum theory of Paramagnetism.

20. Derive London's equations.

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